

Pteridophytic Flora of Rajasthan: A Review

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ABSTRACT

About 63 species belonging to 29 genera of pteridophytes have till date have been reported from Rajasthan dating from king's "Sketch of flora of Rajputana" (1878-79). But an exhaustive survey of all pteridophytic localities during different seasons of the year during the past decade (1975-85) has revealed the occurrence of many species belonging different genera. Thus, *Athyrium hohenockerianum*, *Asplenium lanulatum*, *Cheilanthes belangeri*, *Botrychium lanuginosum*, *Dryopteris parasitica*, *Pityrogramma calomelanos*, *Pteris cretica* and *Athyrium parasnathense* are seen. This may be regarded as a clear indication that these taxa have recently been lost/eradicated from Rajasthan due to one factor or the other. It has also been regularly observed that the population densities of many of the present day. Rajasthan pteridophytes have been decreasing at an alarming rate specially in respect to such restricted taxa as *Asplenium pumilum* var. *hymenophylloides*, *Selaginella rajasthanensis*, *Isoetes reticulata*, *I. rajasthanensis* and *Marsilea aegyptiaca*. Similarly, populations of some ferns growing at Mt. Abu like *Ophioglossum gramineum*, *Araiostegia pseudocystopteris*, *Pteris vittata*, *Dryopteris cochleata* and *Nephrolepis cordifolia* are also becoming thin and localised and reported as "seriously rare" taxa of Mt. Abu. Seriousness and severity of the threat to pteridophytic flora of this region is emphasized specially because of the scantier floristic resources of the state. *Adiantum recurvatum* (D.Don) Fr. – Jenk is a new record to the pteridophytic flora of Rajasthan.

KEYWORDS: pteridophytes, Rajasthan, flora, species, restricted, genera, taxa, record

INTRODUCTION

Rajasthan state is situated in between 23°03' and 30°12' N latitude and 69°03' and 78°12' E longitude. The Aravalli ranges which is one the oldest mountain range of the world, divides the Rajasthan into two vegetational segments like xerophytic and mesic. Todgarh-Raoli Wildlife Sanctuary located in central position of Aravalli range. Xerophytic and mesic vegetation occurs as mixed formation in this Sanctuary.[1,2]



Todgarh-Raoli Wildlife Sanctuary

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The sanctuary is also an ecotone of both vegetational segments. Naturally variations in Pteridophytic flora are represented in this region. It is bounded on the north by Ajmer district, on the south by Udaipur district, on the east by Rajsamand district and on the west by Pali district. Out of 09 genera of fern and fern allies distributed in the various localities of Todgarh-Raoli wild life sanctuary 04 genera namely *Actinopteris*, *Cheilanthe*, *Salvinia* and *Azolla* are representing by single species each. *Marsilea* is represented by two species while *Adiantum* is represented by three species. [3,4]



Actiniopteris

The majority of fern genera represented in single species in the sanctuary. We have frequently observed that the population densities as well as number of individuals of *Marsilea aegyptiaca*, *Adiantum philippense* and *Cheilanthes farinosa* species fall in the category of RET and many fern taxa are gradually decreasing at an alarming rate. *Actiniopteris radiata* (Swartz) Link, is one of the most widely distributed xerophytic fern of Todgarh-Raoli wild life sanctuary. Grows on old walls and in rock crevices. *Adiantum capillus-veneris*, *Marsilea minuta* and *Azolla pinnata* is commonly found. [5,6]



Azolla

Kumbhalgarh Wildlife Sanctuary in the south central part of Rajasthan spreads over the Udaipur, Pali, Ajmer and Rajsamand districts of Rajasthan state and forms a special ecotone between hilly forests of Aravallis and Thar Desert located in the west. The pteridophytes which form a sizeable component of floral resources of Rajasthan are of tremendous academic and medicinal importance, have largely been neglected from this sanctuary, therefore, to document and find out the present status of these plant species, Kumbhalgarh Wildlife Sanctuary of Rajasthan was visited time and again. [7,8]



Cheilanthes farinosa

The area of KWS has been found to be rich in pteridophytic floral diversity. A total of 15 species belonging to 11 genera and six families of pteridophytes have been recorded from the area of this Sanctuary of Rajasthan. Of these, six pteridophytic species namely *Equisetum ramosissimum* Desf. subsp., *Adiantum caudatum* L., *Azolla pinnata*, *Marsilea minuta* L., *Ceratopteris thalictroides* (L.) Brong., and *Ophioglossum petiolatum* Hook. have been recorded for the first time from this locality. *Asplenium pumilum* and *Christella dentata* (Forsk.) Holttum recorded by earlier workers could not be relocated despite the keen and thorough search of the localities reported by them. [9,10]



Kumbhalgarh Wildlife Sanctuary

Dense populations of *Pteris vittata* L. and *Equisetum ramosissimum* have been recorded at several localities in this sanctuary area which is rarely seen in other parts of the state. Genus *Adiantum* has been found to be represented by four species *Aleuritopteris* by two and rest of the genera are represented by single species. Pteridophytes represent ancient lineages of plants, they are widely distributed yet exhibit habitat specificity, therefore any human interference in their natural habitat may lead to their decline. Therefore, steps for their conservation should be taken up keeping in view the scantier floristic resources of the state. [11,12]



Equisetum ramosissimum

Discussion

Ferns present an array of cytological complexities with allopolyploidy playing a pivotal role in speciation. It was this realization which prompted cytological study of the rare endemic population of *Marsilea coromandelina* found in a small patch en route Borawas. Besides, spore germination experiments have also been taken up in *M.minuta* and *M.coromandelina* populations of Kota. [13]



Aravalli Ranges

Though, such studies have been undertaken in the desert taxa of *Marsilea* eg. *M.aegyptiaca*, *M.rajasthanensis*, and *M.diffusa* by Bhardwaja and his associates (1997), such studies have now been carried out in *M.minuta* and *M.coromandelina* for the first time in the hope that this will add to our knowledge of this complex genus and its distribution in Rajasthan. Pteridophytic flora of Rajasthan is mostly confined to Mt. Abu and Hadauti plateau which face interesting diversified status due to their variable climatic conditions. Extremity of climate is a characteristic feature of Rajasthan. Due to heavy rainfall, Mt. Abu possesses the richest vegetation of pteridophytes (approx 36 species, 15 genera) in entire Rajasthan. It is only during the rainy months that the ferns mainly flourish and are plentiful in number. In addition to Aravalli ranges, these vascular cryptogams are frequently observed in Hadauti plateau where thick and dense forests, wet and shady

habitats, streams, springs and other water reservoirs exist and are known as favorite shelter places for pteridophytic species.



Hadoti Plateau

The North and North-East portions of the state are poor in pteridophytic vegetation as these areas are full of sand dunes.



Selaginella reticulata

However, along the banks of ponds, a few species of *Marsilea* e.g. *M.aegyptica* at Jodhpur, *M. minuta* and *M.rajasthanensis* at Kolyat (Bikaner) grow during rainy season. Therefore, pteridophytes of Hadauti plateau hold a significant position with respect to their occurrence and distribution. During rainy season a number of pteridophytes grow and survive in the valleys and ravines of River Chambal. *Selaginella reticulata* (Hook. & Grey.) Spring (Selaginellaceae) - A New Record to the Pteridophytic Flora of Rajasthan has been accessed.[14]

Results and Conclusions

Pteridophytes, the seedless vascular plants, had a very flourishing past in dominating the vegetation on the earth about 280-230 million years ago. Although they are now largely replaced by the seed bearing vascular plants in the extant flora today, yet they constitute a fairly prominent part of the present day vegetation of the world. India with a highly variable climate has a rich diversity of its flora and Pteridophytic flora

greatly contributes to its diversity. Pteridophytes also form an interesting and conscious part of our national flora with their distinctive ecological distributional pattern. [15]



Aleuritopteris

On a very conservative estimate 500 species of ferns and 100 species of fern-allies are on record from India. According to a census, the Pteridophytic flora of India comprises of 67 families, 191 genera and more than 1,000 species including 47 endemic Indian ferns, less than 10% of those reported previously and 414 species of Pteridophytes (219 At risk, of which 160 critically endangered, 82 Near-threatened and 113 Rare), constituting 41-43 % of the total number of 950- 1000 Pteridophytes of India. Chandra Shubhash (2000) recorded 34 families, 144 genera and more than 1100 species of ferns with about 235 endemic species from Indian region. The vascular flora of our country in general has about 15,000 species and as a constituent of Indian flora of vascular plants, the ferns and fern-allies form only five percent part as far as the number of species is concerned. But, due to their abundance in individuals as well as their conspicuousness in epiphytic vegetation and in the terrestrial vegetation along forest margins, roadsides and forest floors, the contribution of ferns and fern-allies to the vegetational pattern in India rank only next to the flowering plants.[16]

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